

Rapid In-Place Composite Rotor Damage Detection, Phase I

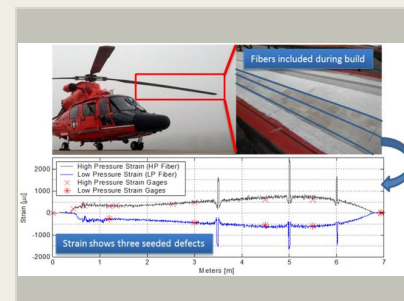
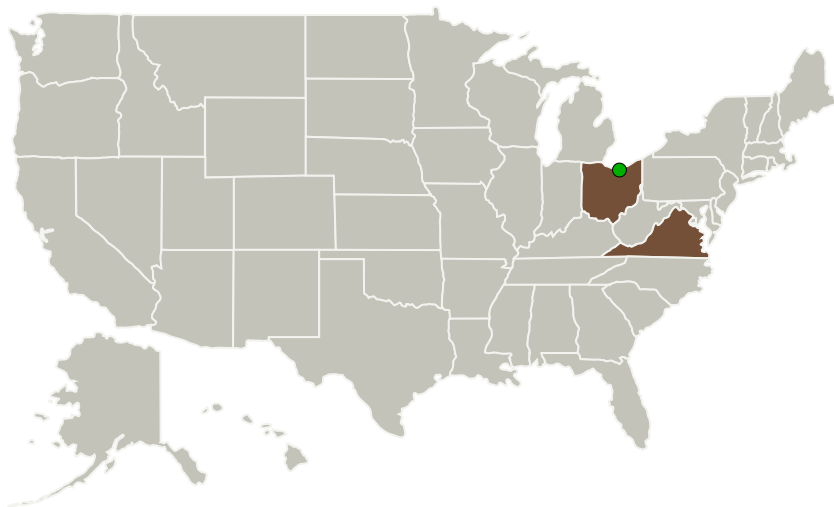
Completed Technology Project (2016 - 2016)



Project Introduction

Luna Innovations is proposing to develop the Rapid In-Place Composite Rotor Damage Detection (RIPCoRDD) for determining and tracking the structural health of composite rotorcraft blades. There is a need for accurate, reliable assessments of rotor condition, particularly for damage which may not be visible from the surface. The RIPCoRDD system is designed such that it will result in absolutely no increase in weight, power consumption, or volume of the rotorcraft. The core of the RIPCoRDD device is a unique, distributed, fiber optic strain sensor which provides spatially dense strain measurements (every 1.25-5 mm) within the composite structure of the blade, coupled with a ground based installation of Luna's proven instrumentation. During Phase I Luna (with guidance from a rotorcraft OEM partner) will demonstrate the ability to detect and characterize damage which occurs in sample composite structures. During Phase II Luna will mature the technology to TRL6 by testing the system in a complete rotor. Commercialization will focus on transitioning the technology first to OEM manufacturers for non-destructive inspection applications, followed by deployment to rotorcraft end users for lifetime monitoring and diagnostics.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Luna Innovations, Inc.	Lead Organization	Industry	Roanoke, Virginia
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Transitions

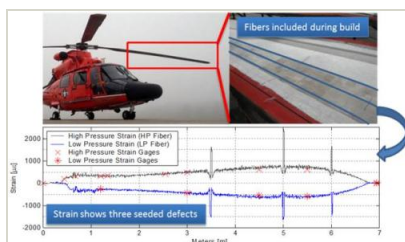
▶ **June 2016:** Project Start

✓ **December 2016:** Closed out

Closeout Documentation:

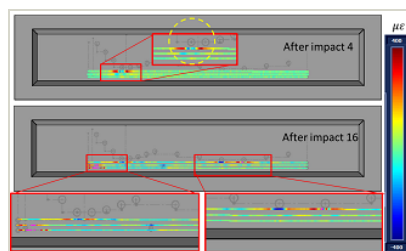
- Final Summary Chart(<https://techport.nasa.gov/file/139726>)

Images



Briefing Chart Image

Rapid In-Place Composite Rotor Damage Detection, Phase I
(<https://techport.nasa.gov/image/130174>)



Final Summary Chart Image

Rapid In-Place Composite Rotor Damage Detection, Phase I Project Image
(<https://techport.nasa.gov/image/127454>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Luna Innovations, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

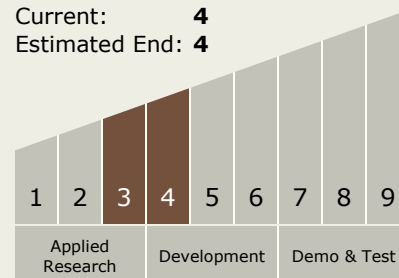
Carlos Torrez

Principal Investigator:

Daniel Kominsky

Technology Maturity (TRL)

Start: 3
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.4 Aeroacoustics

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System